Abstract of the Disclosure

[0086] A method and system senses the attitude of an accelerating object by measuring acceleration with accelerometers in three orthogonal axes and measuring angular rate with angular rate sensors disposed about each such axis to compute attitude of the object accurately relative to a vertical axis. A processor updates a quaternion representation of attitude based upon the angular rate of the object, and a corrective rate signal is determined from level frame acceleration as a reference for a Kalman filter in calculating the attitude of the object.